

# REGIONAL IMPACTS

## INTRODUCTION

The Blackstone River Valley National Heritage Corridor is a region in transition. Changes will affect the land, its natural and cultural resources, just as they did throughout history. The challenging new opportunity before the communities of the Blackstone Valley, different from two centuries ago, is the possibility of anticipating change and planning ahead for a desired outcome. Growth and land use patterns can be influenced, guided and shaped to maximize benefits and minimize adverse impacts. Local decisions are key to bringing about the benefits of change. Understanding the regional impacts on natural resources, utilities and other services, of trends in population movements, employment centers and transportation systems, will provide the basis for such local land use decisions.

Between the 1930s, when a decade of industrial disinvestment culminated in the abandonment of mills and the out-migration of resident populations, and the 1980s, when real estate development boomed, the Blackstone River Valley lacked any significant regional commercial investment and economic growth. The Valley experienced relative stagnation which indirectly protected historic, cultural and natural resources. The growth of recent years has brought much needed economic opportunities for Valley residents and businesses and a corresponding increase in threats to many types of resources. This section identifies high growth patterns and evaluates their potential impacts, in an effort to shape a growth management strategy for the Heritage Corridor.

## LAND USE DECISIONS

Changes on the land come slowly, incrementally. Comparing aerial photographs of a portion of the Blackstone Valley landscape in 1939 with a view from 1992 clearly shows the spread of low density residential growth, the appearance of car-oriented commercial uses with their attending surface parking, and the loss of both agricultural land and scenic landscape. The area around Quinnville (old Ashton) in Lincoln and Ashton in Cumberland, Rhode Island contains in 1939 a truly open meadow on the island between the Blackstone River and Canal. By 1992, almost half of the area is covered with new growth. These patterns of development, and sometimes laissez-faire land management practices, affect natural and cultural resources throughout the region as well as the quality of life of its residents, new and old. More than dramatic and sudden changes or ill-intentioned policies, it is the cumulative impact of small land use decisions, and the absence of resource management practices, that cause this slow erosion of valued resources.

By collaborating on regional land use policies and integrated resource management, each community in the Valley stands to gain more in control and power to influence the evolution of its environment than by acting alone. Yet it is the continued involvement of concerned residents and businesses at the grass-roots level which can build the foundation for regional strength and reverse the process of erosion, of land use development by default. Several initiatives in growth management and resource protection already show promising signs that the communities of the Valley can indeed shape their land use and resources future.

*Area surrounding  
Quinnville (Old Ashton)  
in Lincoln and Ashton in  
Cumberland, Rhode  
Island, in 1939 (right)  
and 1992 (below)*



## *Map of Transportation and Growth Patterns*

The map of **Transportation and Growth Patterns** is meant to identify general trends and conditions reported by Central Massachusetts Regional Planning Commission, Rhode Island Division of Statewide Planning and various studies. The map identifies the predominant commuting patterns to and from the valley, as well as existing and anticipated patterns due to employment growth and highway accessibility. The “employment centers” as expressed on the map, are meant to show predominant growth areas in employment, and do not suggest that those are the only areas experiencing job growth. Projections for increased traffic along major thoroughfares are also illustrated on the map, and specifically relate to expected commuter and commercial traffic.

### **GROWTH PATTERNS: SUBURBAN MIGRATION, COMMUTING ROUTES AND EMPLOYMENT CENTERS**

Increased mobility, resulting in greater choices for people as to where to live and work, is the dominant factor affecting land use development today. Interstate 495, an example of a modern technology highway, and Route 128, the first beltway around Boston, have contributed to the decentralization of the metropolitan area. They have given form to a pattern of development clustered around highway exit and access points throughout nearby regions. Low-density housing subdivisions, commercial uses to service them, and employment centers in suburban office and industrial parks, have proliferated. Unfortunately, this type of development occurs on open space rather than on former industrial sites, such as mill complexes, or in the commercial centers of towns.

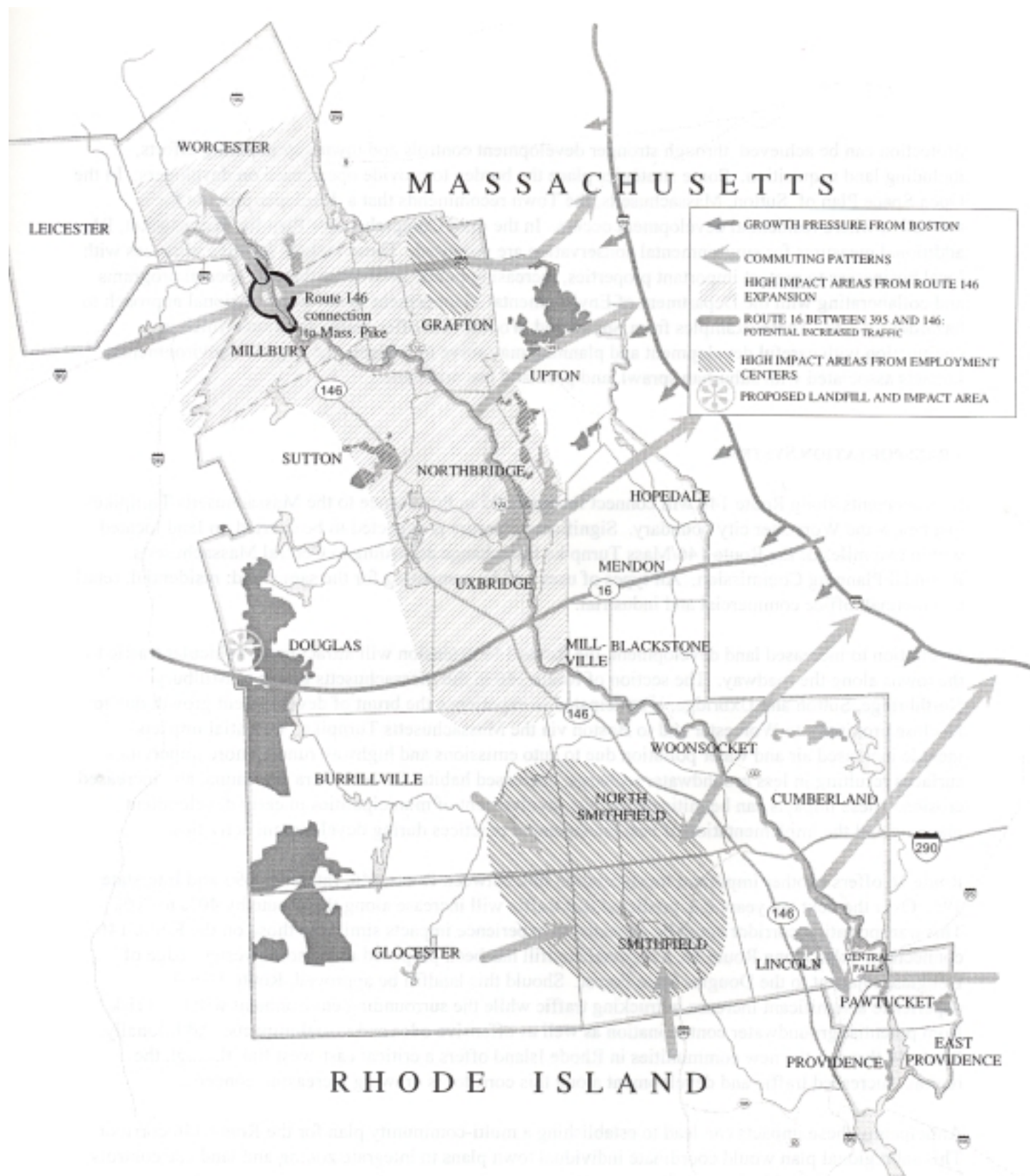
While the primary development pressure on the Blackstone Valley is from Boston via Interstate 495, current and future employment opportunities in Grafton and the southern portion of the Valley (Smithfield, North Smithfield, Burrillville, and Lincoln, Rhode Island) have created new destinations for commuters. Companies such as Fidelity, Fleet, Amica and Cytogenetics will provide over the next few years approximately four thousand new jobs in this area of Rhode Island which is accessible from Interstates 195, 295, 495, Routes 7 and 146, as well as the Massachusetts Turnpike. The expanding Biotech Park in north Grafton and the proposed commuter MBTA Station to Boston represent significant employment and commuting impacts. The result of these employment centers will be an increased need for housing, municipal services and commercial uses. Unless development is encouraged at the local level toward historical centers and villages, this growth is anticipated to further suburban sprawl and strain the existing infrastructures of transportation, utilities and natural resources.

An influx in population – commuters to Boston, Worcester and Providence, as well as to new local employment centers – can deplete open space resources. New owners are mostly first-time home buyers with young children. Besides the land taken for residential development, an expected growth in school-age children will cause towns to look at remaining open space to accommodate new schools.

Typical housing subdivisions consist of home sites of an acre or more. Large properties with high-maintenance lawns strain local resources, particularly water supplies. Suburban landscaping practices can pollute or alter the quality of ground and surface water by adding nutrients (fertilizers) or chemicals (pesticides) to the water stream.

Open space provides a number of highly valued attributes to communities. Among these are viewsheds, habitats for flora and fauna, groundwater recharge areas and recreational opportunities. Open space protection can be achieved through stronger development controls and town/city planning efforts, including land acquisition. Some strategies place the burden to provide open space on developers. In the





Transportation and Growth Patterns

Open Space Plan of Sutton, Massachusetts, the Town recommends that a developer provide for recreation where residential development occurs. In the draft Comprehensive Plan for Woonsocket, RI, additional measures for environmental conservation are proposed. These include forming alliances with local businesses to protect important properties, increasing public awareness through special programs and collaborating with the Department of Environmental Management to develop a regional approach to hazardous waste. These examples from Sutton and Woonsocket offer viable solutions which in conjunction with careful development and planning may serve to mitigate the negative environmental impacts associated with suburban sprawl, and past land use problems.

## **TRANSPORTATION SYSTEMS**

Improvements along Route 146 will connect Interstate 95 in Providence to the Massachusetts Turnpike just below the Worcester city boundary. Significant pressure is expected to be exerted on land located within two miles of the Route 146/Mass Turnpike Interchange according to Central Massachusetts Regional Planning Commission. All types of uses will be competing for the same land: residential, retail commercial, office commercial and industrial.

In addition to increased land development, the Route 146 extension will attract more vehicular traffic to the towns along the roadway. The section of Route 146 in the Massachusetts towns of Millbury, Northbridge, Sutton and Uxbridge, is anticipated to experience the brunt of development growth due to its close proximity to Worcester and to Boston via the Massachusetts Turnpike. Potential impacts include increased air and water pollution due to auto emissions and highway runoff, more impervious surfaces resulting in less groundwater recharge, decreased habitat for both flora and fauna, and increased erosion. These impacts can be mitigated by the involvement of municipalities in early development planning and the implementation of best management practices during development activities.

Route 16 offers another important transportation link between Route 146, Interstate 495 and Interstate 395. Over the next ten years it is predicted that traffic will increase along this Route by 40% to 70%. This transportation corridor could be expected to experience impacts similar to those on the Route 146 connection. Also along Route 16, a regional landfill has been proposed at the southwestern edge of Douglas, adjacent to the Douglas State Forest. Should this landfill be approved, Route 16 will experience a significant increase in trucking traffic while the surrounding environment will be at risk from potential groundwater contamination as well as offensive odor and visual impacts. Additionally, Route 44 through the new communities in Rhode Island offers a critical east-west link through the region. Increased traffic and development along this corridor is drawing increasing concern.

Anticipating these impacts can lead to establishing a multi-community plan for the Route 146 corridor. This sub-regional plan would coordinate individual town plans to integrate zoning and land use controls to manage growth and its impacts in a consistent manner.

## *Map of Impacts on Services*

The map of **Impacts on Services** generally represents existing regional utilities, and expected impacts as demand on services increases. Information was collected from studies, state and regional planning offices and interviews with utility consultants.

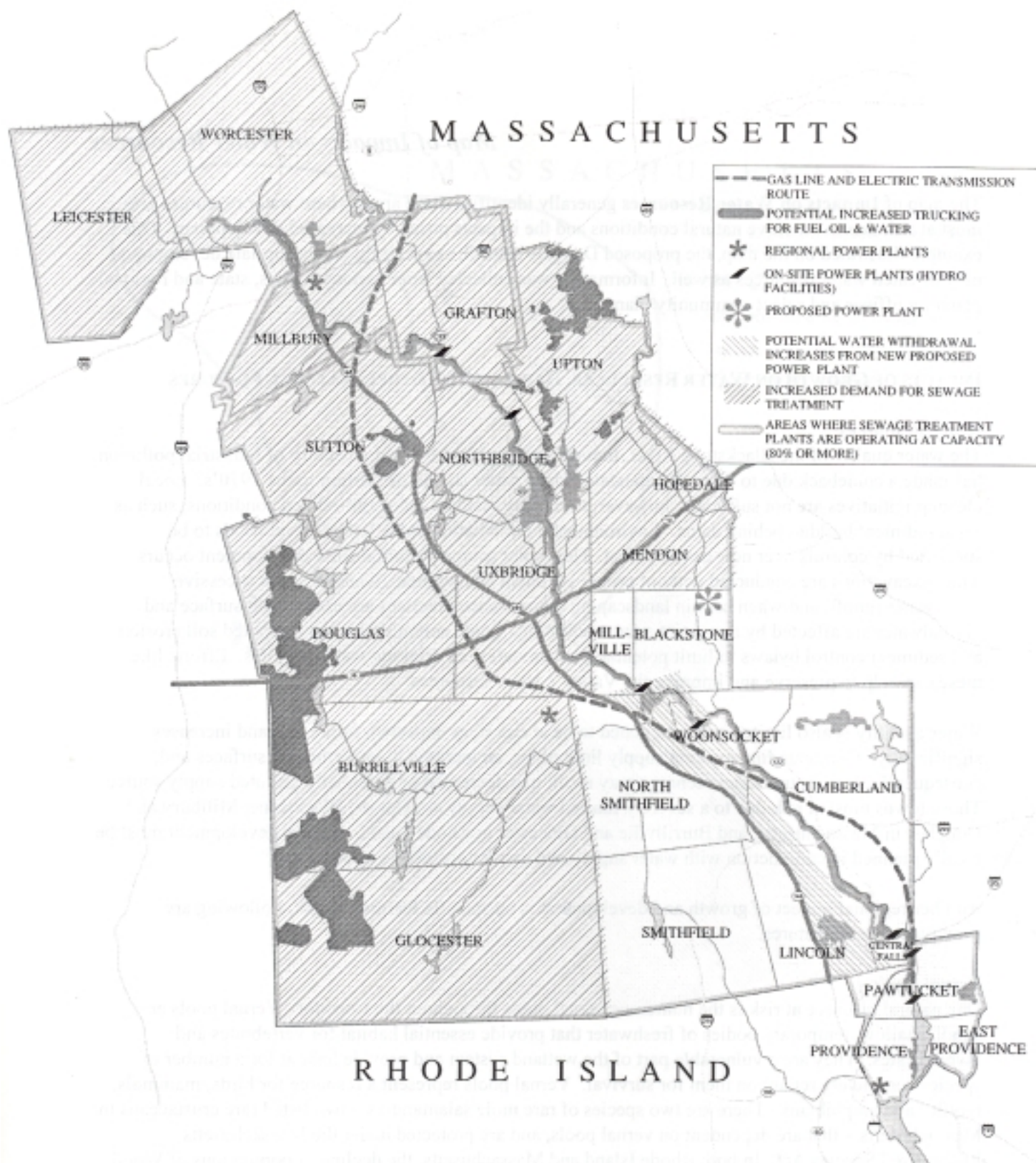
### **MUNICIPAL SERVICES AND UTILITIES INFRASTRUCTURE**

As development increases in the Corridor, services provided to residents will need to be expanded: infrastructure such as sewers, solid waste disposal facilities, gas and electric lines, as well as educational and municipal services. These services all have finite capacities. For example, the sewage treatment facilities in Millbury and Grafton, MA are presently at 80% or more capacity and there is growing demand by residents for sewer extensions, according to figures reported to the Environmental Protection Agency. In areas not sewered, the potential for septic systems as a means of sewage treatment is limited. In Northbridge, 75% of the soil poses severe limitations for septic systems, while in Sutton 80% of the soil is highly inappropriate for septic absorption, as rated by the United States Department of Agriculture. Communities within the Corridor must plan for future sewage discharge needs for both commercial and residential development when determining the extent of investment in their wastewater treatment facilities.

Demand can be expected to increase for gas and electric lines. These, however, are fairly easily upgraded and extended. Because of its water supplies, the Blackstone River Valley has been targeted as a prime location for new power-generating facilities. There are currently four regional facilities in the Heritage Corridor: in Millbury, Providence, Pawtucket and Burrillville. A new facility is currently planned for Blackstone, MA and more development projects are predicted for the future as demand increases and older, less efficient facilities throughout the northeast are closed.

There are, however, several potentially negative impacts stemming from potential expansions. An extension of gas and electric service to the Route 146 corridor will provide access to the west, but may result in visual intrusions such as electric power generation facilities, cooling towers and water vapor plumes, transmission lines, as well as increased tanker truck traffic. An increased use of the roads by tanker trucks carrying fuel or water may cause excessive wear on the road itself and produce subsequent associated costs to local public works departments. Additional impacts include noise and air pollution and highway runoff which can diminish both groundwater and surface water quality. The City of Woonsocket has suggested requiring controlled containment structures along all new highways within the watershed to reduce impacts from highway runoff.

Hydroelectric power plants can also be found along dams on the Blackstone River. Some of these facilities cause fluctuation in stream flow, resulting in stressful habitat conditions for wildlife and aquatic systems. Efforts are currently underway to enforce river management at the dams to prevent further adverse impacts.



## *Map of Impacts on Water Resources*

The map of **Impacts on Water Resources** generally identifies those areas where water resources are most at risk due to sensitive natural conditions and the impacts posed by increased development. One example illustrated on the map, the proposed Douglas landfill, suggests that inappropriate development may threaten water resources as well. Information was collected from various studies, state and regional planning offices and select community plans.

### **IMPACTS OF GROWTH ON WATER RESOURCES, HABITATS AND OTHER NATURAL FEATURES**

#### *Water Resources*

The water quality of the Blackstone River, though impoverished by over a century of industrial pollution, has made a comeback due to federally mandated clean water standards starting in the 1970's. Local cleanup initiatives are not sufficient, however, to remedy residual industrial-related conditions, such as toxic sediment buildup behind dams. Environmental remediation at the federal level needs to be supported by controls over new development. Non-point source pollution from development occurs when excavations are conducted without proper sediment containment, where there is excessive stormwater runoff, and when certain landscaping maintenance practices are used. Both surface and groundwater are affected by non-point source pollution. Some communities have adopted soil erosion and sediment control bylaws to limit potential contamination of drinking water supplies. Efforts like these can help to preserve and improve the Valley's water resources.

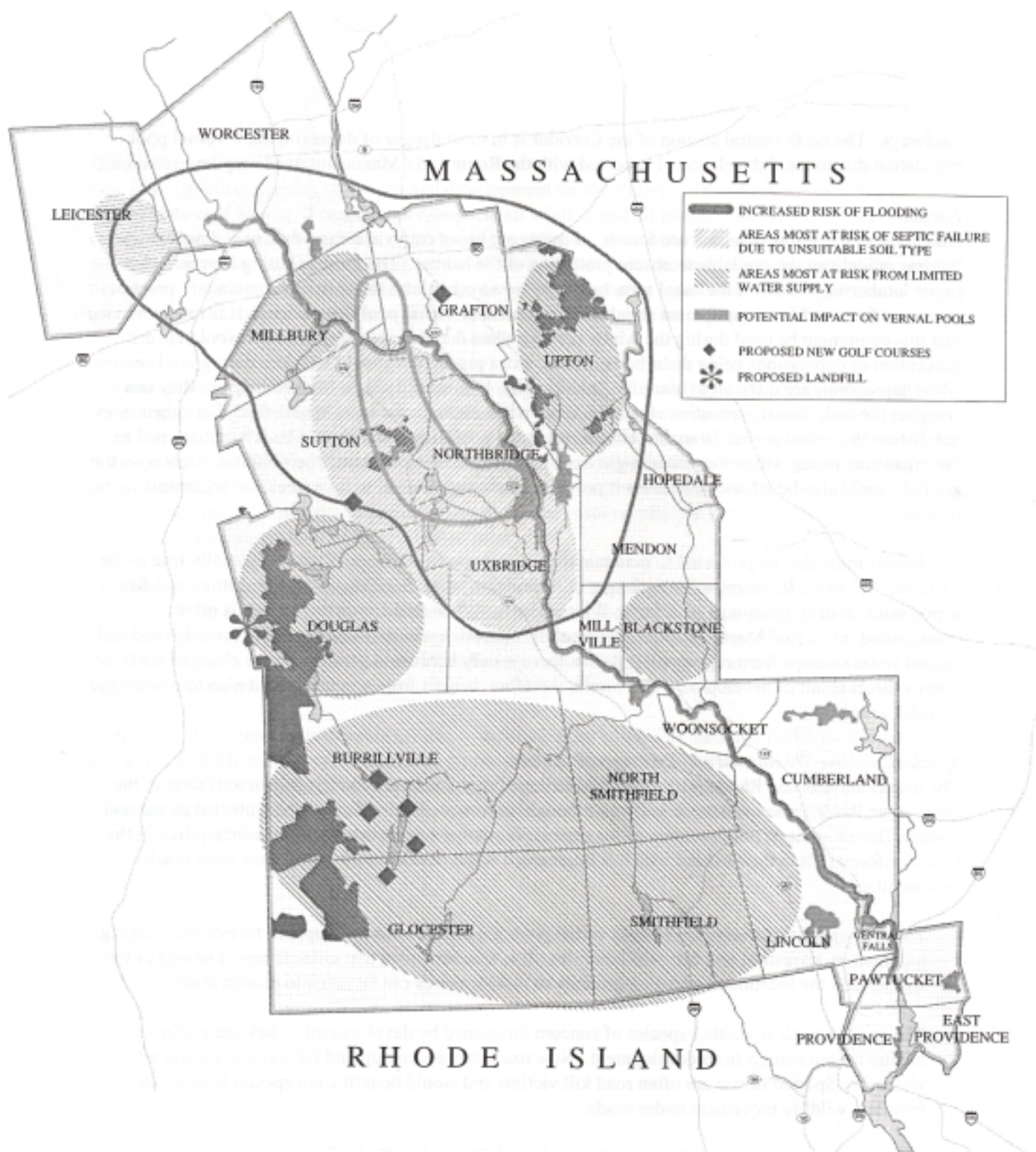
Water quantity is also limited and anticipated to be at risk if, as expected, future demand increases significantly. Compounding existing supply limitations, an increase in impermeable surfaces and, consequently, less groundwater recharge may result in a decreased or potentially polluted supply source. Those towns most at risk due to a severely limited water supply are Upton, Blackstone, Millbury and Douglas, in Massachusetts, and Burrillville and Glocester in Rhode Island. Future development must be locally planned in conjunction with water supply and aquifer protection issues.

Another regional impact of growth and development is on specific features at risk. Following are examples of such features.

#### *Vernal Pools*

One natural resource at risk is the numerous vernal pools throughout the Corridor. Vernal pools are small, shallow, temporary bodies of freshwater that provide essential habitat for vertebrates and invertebrates. They are a vulnerable part of the wetland system and provide habitat for a number of species completely reliant on them for survival. Vernal pools represent a resource for birds, mammals, reptiles and amphibians. There are two species of rare mole salamanders – two listed rare crustaceans in Massachusetts – that are dependent on vernal pools, and are protected under the Massachusetts Endangered Species Act. In both Rhode Island and Massachusetts, the decline of populations of Wood Frogs, dependent on vernal pools for breeding, signals a need to attend to these special areas. The bottom sediment of these pools contains eggs and other stages of invertebrates that are a necessary element in the food chain. Therefore, these water bodies need to be protected from heavy machinery and from lumbering practices which pose the greatest threat. Vernal pools are often filled as a result of rapid development. Because these pools are at times dry, it is difficult to detect them and developers may not realize their existence. Certifying all vernal pools and requiring a 50 to 100 foot buffer zone can eliminate filling, prevent flooding and reduce contamination from lawn and stormwater run-off from roadways. The north central section of the Corridor is in most danger of damaging their vernal pool population due to rapid development expected with the Route 146 / Massachusetts Turnpike exchange.





## Impacts on Water Resources

### *Forests*

Another specific resource at risk are forests. Forests are being cut to accommodate new development, but few guidelines are available to ensure protection of the habitat. The Forest Cutting Practices Act limits lumbering to 50% of the basal area, but there are no other laws that detail precautionary practices to protect forests. Heavy equipment should not be used near vernal pool depressions. It is recommended that this equipment be used during the winter months when the ground is frozen. This would ensure prevention of depressions being disturbed or filled. Extra precaution should be taken during mud season when depressions are difficult to identify. Additionally, logs should not be stacked because they can compact the soil. Equal precaution should be taken when cutting wood and branches so that debris does not disturb the vernal pools. Branches already set in the pools, however, should be left undisturbed as the organisms living within the water might have incorporated the wood into their habitat. Debris on the ground should also be left alone because it provides shade and protection, like trees, for organisms in the forests.

The forests must also be protected to maintain the present species of trees. This is especially true in the swamps. White Cedar swamps are in danger of destruction when flooding, excessive cutting and fire suppression destroy groupings of Atlantic White Cedars. When this occurs the swamp is often transformed into a Red Maple swamp. Additionally, excessive winter browsing can prevent burned and logged cedar swamps from regenerating so that there is only hardwood growth. These changes are most often a direct result of development and would, therefore, benefit from a management plan to discourage harmful activities.

### *Special Concern, Threatened and Endangered Species*

The Massachusetts and Rhode Island Natural Heritage Programs have identified numerous sites in the Blackstone River Valley which are known or thought to provide habitat for rare or protected plants and animals (listed in the Wildlife section of the report). A number of species of special concern live in the Corridor forests. It is their habitat which is fragmented when development encroaches from nearby communities.

- The *blue-spotted salamander* requires vernal pools for reproduction and upland forests for foraging, hibernation, terrestrial and fossorial activities. It is recommended that citizens report sightings of the species and the location of breeding grounds so that measures can be taken to protect them.
- The *spotted turtle* is another species of concern threatened by development. They are victims of habitat fragmentation from development. New roads can destroy upland habitat and greatly alter wetlands. Spotted turtles are often road kill victims and would benefit from special features to facilitate wildlife movement under roads.
- *Wood turtles* are a species of concern that are greatly dependent on streams. It is important that development does not disrupt their habitat. The grounds along the stream should be preserved and selective cuttings of trees should be observed 50 to 300 feet from streams to maintain this species. Prohibiting heavy machinery within 50 feet of streams, and minimizing its use within 50 to 100 feet of streams, would help protect this species. Wood turtles would also benefit from slash pilings.
- The *eastern box turtle* is most threatened by fragmentation and destruction of habitat. Roads bisecting habitat can reduce and destroy populations.

### *Habitat Fragmentation*

One of the greatest impacts of growth and development on the Valley's natural resources is the fragmentation of habitat. Fragmentation impacts all wildlife and all plants. Not only does development reduce the area of habitat but it also introduces edge effects – such as landscaping practices and products, noise and air pollution, and wandering pets – which extend far into the remaining habitat and threaten to destroy it. Because wildlife corridor development is possibly being foreclosed, species protection is even more urgent. Leapfrog development divides greenways so that they are no longer useful sanctuaries for wildlife. New roads should be designed to avoid habitat.

Mandated buffer zones of 50' to 100' around vernal pools and other wetlands are often inadequate to protect species which may roam several hundred feet upland from the resource. Homing instincts in some species make them return to a vernal pool, pond, or wetland from which they migrated, even if the resource has been filled in, substantially altered, or surrounded by development, exposing the wildlife to peril. Nonetheless, the concept of restricting development in zones around specific natural features because they provide habitat and protect water resources is sound. Efforts need to be sustained and expanded to maintain a base of habitat protection.

Fortunately, both states of Rhode Island and Massachusetts have legislation within the Corridor to protect wildlife along the riverway. Citizen observations are the best way of locating rare wildlife so that more stringent regulations, such as those of the Massachusetts Rivers Protection Act, can be placed on their habitat. This also serves to increase public awareness of development impacts on surrounding habitat environment.

States should concentrate protection efforts on defending the borders of the large parks, conservation areas, and wildlife management areas which now provide the necessary territory and corridor mobility to support a diversity of species. At the local level, towns should pursue acquisition programs that expand protected areas, consolidate isolated open spaces into continuous corridors and greenways, and control development patterns with respect to location as well as size.